

Edible Tectonics

BACKGROUND:

Plate tectonics is one of the central theories of earth science. It explains why earthquakes and volcanoes happen, where they occur, and why mountain ranges, ocean trenches and faults have formed.

The **lithosphere** (the crust and the solid upper part of the mantle) is not one solid mass but is broken into small sections called **tectonic plates**. Some of these plates are large and others are smaller. Although the plates touch, they are not connected. Each plate floats independently on the **asthenosphere** (the part of the mantle that acts like a liquid).

The location where two plates are floating side by side is called a **boundary**. Plates will interact with each other at this boundary. If the plates are running into each other, the boundary is called a **convergent boundary**. If the plates are moving away from each other, the boundary is a **divergent boundary**. If one plate is sliding past the other plate, the boundary is called a **transform boundary**. This activity will use a small model to introduce these types of boundaries.

PROCEDURE:

1. Obtain two small Milky Way candy bars and a paper towel from your teacher. Unwrap one of the bars and use your fingernail to make a few cracks across the top middle portion of its top. The chocolate on each side of the cracks represents a tectonic plate.
2. Hold each end of the candy bar with your thumb and forefinger and SLOWLY stretch the candy bar, pulling it no more than 1/2 to 1 inch apart. You have created a divergent plate boundary. The chocolate should separate, exposing the caramel. The exposed caramel represents the top of the asthenosphere (magma that can rise up through the crust).
3. Slowly push the stretched candy bar back together. This action creates a convergent plate boundary. The chocolate on the surface may crumble, producing smaller tectonic plates. The chocolate may form mountain ranges where the chocolate piles up. The chocolate from one side may “slide under” the chocolate from the other side.

4. Each of you may eat one side of your candy bar.
5. Unwrap the other candy bars and use your fingernail to make a few cracks across the top middle portion of its top. Also use your fingernail to make a straight line from one end of the candy piece to the other. Pull the two sides apart, then lightly push them back together. Use your fingernail to make a straight line from one end of the candy piece to the other.
6. Gently push the right hand piece of candy away from you while pulling the left hand piece toward you. The sides may stick together so you may have to increase the force of your push. This action creates a transform plate boundary.
7. Each of you may eat one side of your candy bar.

SUMMARY:

1. Name the layers of your candy bar and what layers of the Earth each would represent.
2. What type of plate boundary was formed when you pulled the pieces apart? If that same action happened to the plates on Earth, what would you expect to see?
3. What type of plate boundary was formed when you pushed the pieces apart? If that same action happened to the plates on Earth, what would you expect to see?
4. What type of plate boundary was formed when you slid the pieces past each other? If that same action happened to the plates on Earth, what would you expect to see?
5. What is the force in the Earth that is moving the crustal plates along the surface?